

CLAIMS

What is claimed is:

1. A device for moistening an envelope flap, comprising:
  - a reservoir for holding a moistening fluid;
  - an applicator mounted above the reservoir for applying the moistening fluid to the envelope flap; and
  - a fluid transfer member, mounted for rotation about a horizontal axis such that a portion of the fluid transfer member is submerged in the moistening fluid, for transferring moistening fluid from the reservoir to the applicator while the transfer member rotates.
2. The device according to claim 1, wherein the fluid transfer member includes a plurality of pairs of opposed substantially vertical surfaces, the surfaces of each pair being separated by a distance that is sufficiently small to allow moistening fluid to be held between the surfaces by surface tension of the fluid to raise the moistening fluid above a surface of the fluid in the reservoir as the transfer member is rotated.
3. The device according to claim 2, wherein at least some of the surfaces of the pairs of opposed surfaces are substantially annular.
4. The device according to claim 3, wherein the fluid transfer member includes a substantially cylindrical hub portion and a plurality of generally annular fins extending radially outwardly from the hub portion.
5. The device according to claim 4, wherein at least some of the fins each terminate in a knife edge oriented so as to point away from the hub portion of the transfer member.
6. The device according to claim 5, wherein the plurality of fins include a first plurality of fins having a first diameter and terminated in a knife edge and a second plurality of fins interspersed with the fins of the first plurality and having a second diameter that is less than the first diameter.

7. The device according to claim 4, further comprising a brush mounted in the reservoir and positioned to be combed by the fins of the transfer member as the transfer member rotates.

8. The device according to claim 1, wherein the applicator comprises a brush.

9. The device according to claim 8, wherein the brush is mounted so as to pivot between an upper position in which the envelope flap is interposed between the brush and the transfer member and a lower position in which the brush is combed by the fins of the transfer member.

10. The device according to claim 1, further comprising:

drive means coupled to the transfer member for rotationally driving the transfer member; and

control means operatively connected to the drive means for selecting a rotational rate at which the drive means rotationally drives the transfer member.

11. The device according to claim 10, wherein the control means selects the rotational rate at which the drive means rotationally drives the transfer member based at least in part on at least one of (a) a rate at which envelopes are transported past the applicator, and (b) a size of at least one envelope transported or to be transported past the applicator.

12. The device according to claim 10, further comprising:

sensing means, operatively connected to the control means, for sensing at least one environmental condition;

wherein the control means selects the rotational rate at which the drive means rotationally drives the transfer member based at least in part on a signal output from the sensing means.

13. The device according to claim 10, further comprising:

sensing means, operatively connected to the control means, for detecting a length of an envelope transported past the applicator;

wherein the control means selects the rotational rate at which the drive means rotationally drives the transfer member based at least in part on a signal output from the sensing means.

14. The device according to claim 1, further comprising:

means for defining an envelope transport path along which envelopes are transported, the applicator being positioned adjacent the envelope transport path.

15. A method for moistening an envelope flap, comprising the steps of:

rotating a fluid transfer member about a horizontal axis to transfer moistening fluid from a reservoir to an applicator; and

contacting the applicator with the envelope flap to transfer the moistening fluid from the applicator to the flap.

16. The method according to claim 15, further comprising:

selecting a rotational rate of the fluid transfer member from among a plurality of rotational rates.

17. The method according to claim 16, further comprising:

sensing at least one environmental condition;

wherein the selecting step is based at least in part on a result of the sensing step.

18. The method according to claim 15, wherein the applicator includes a brush, and further comprising:

pivoting the brush between an upper position in which the envelope flap is interposed between the brush and the transfer member and a lower position in which the transfer member combs the brush.

19. A mailing machine comprising:

transport means for transporting an envelope along an envelope feed path;

a reservoir positioned below the envelope feed path and holding a moistening fluid;

means for replenishing the moistening fluid in the reservoir to maintain a substantially constant level of the moistening fluid in the reservoir;

a first brush pivotally mounted along the envelope feed path for transferring moistening fluid to a flap of an envelope transported along the envelope feed path;

a fluid transfer member associated with the reservoir, the fluid transfer member including a substantially cylindrical hub portion and a plurality of generally annular fins extending radially outwardly from the hub portion, the plurality of fins including adjacent pairs of fins, the fins of each adjacent pair being separated by a distance that is sufficiently small to allow moistening fluid to be held between the fins of the adjacent pair by surface tension of the fluid, the fluid transfer member being mounted such that at least a portion of the plurality of generally annular fins are submerged in the moistening fluid in the reservoir;

drive means coupled to the fluid transfer member for rotationally driving the fluid transfer member; and

control means operatively connected to the drive means for selecting a rotational rate at which the drive means rotationally drives the transfer member;

wherein:

as the fluid transfer member rotates, the fluid transfer member raises moistening fluid above the substantially constant level of the moistening fluid in the reservoir to transfer the moistening fluid to the first brush; and

the first brush pivots between an upper position in which the envelope flap is interposed between the first brush and the fluid transfer member and a lower position in which the first brush is combed by the fins of the fluid transfer member.

20. The mailing machine according to claim 19, wherein at least some of the fins of the fluid transfer member terminate in a knife edge oriented so as to point away from the hub portion of the transfer member.
21. The mailing machine according to claim 20, wherein the plurality of fins of the fluid transfer member include a first plurality of fins having a first diameter and terminated in a knife edge and a second plurality of fins interspersed with the fins of the first plurality and having a second diameter that is less than the first diameter.
22. The mailing machine according to claim 19, further comprising a second brush mounted on a bottom wall of the reservoir and positioned to be combed by the fins of the fluid transfer member as the fluid transfer member rotates.
23. The mailing machine according to claim 19, wherein the fluid transfer member is oriented transversely relative to a direction in which the envelope is transported by the transport means.